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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/685,924	10/15/2003	Manabu Aizawa	09792909-5699	7047

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EXAMINER	
WHITTINGTON, KENNETH	
ART UNIT	PAPER NUMBER
2862	

DATE MAILED: 09/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## *Office Action Summary*	**Application No.**	**Applicant(s)**	
	10/685,924	AIZAWA ET AL.	
	Examiner	**Art Unit**	
	Kenneth J. Whittington	2862	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.
2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.
  4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) *1-14* is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.
10)☒ The drawing(s) filed on *15 October 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.
  Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
  Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  a)☐ All b)☐ Some * c)☒ None of:
    1.☒ Certified copies of the priority documents have been received.
    2.☐ Certified copies of the priority documents have been received in Application No. _____.
    3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
  * See the attached detailed Office action for a list of the certified copies not received.

Bot Ledynh
Primary Examiner

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
  Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
  Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Japan on October 18, 2002. It is noted, however, that applicant has not filed a certified copy of the JP2002-304990 application as required by 35 U.S.C. 119(b).

Specification

The disclosure is objected to because of the following informalities: on page 21, line 10, "104" should be "140".

Appropriate correction is required.

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

Claim 9 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from another multiple dependent claim. See MPEP § 608.01(n). For purposes of examination only, claim 9 will be assumed to depend solely from claim 3. Appropriate correction of the claim to proper dependent claim form is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless -
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-6 and 9-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Rovner (US 3,825,823). Regarding claims 1 and 14, Rovner discloses:

a magnetic detection unit having two or more magnetic detection devices with directionality, the magnetic detection devices being disposed at equal intervals based on a predetermined rule in such a way that directionalities thereof are different from each another (See Rovner FIG. 1, items 21-26);

a sampling unit for sequentially switching and sampling electromagnetic conversion outputs of magnetic detection devices of the magnetic detection means (See FIG. 1, item 12 and col. 4, lines 18-56);

a condition determining unit for determining whether or not the electromagnetic conversion output being sequentially switched and sampled by the sampling means meets a predetermined condition (See FIG. 1, items 17, 51 and 52 and col. 4, line 57 to col. 6, line 46); and

a azimuth information output unit for outputting magnetic azimuth information based on a result of the determination of the condition determining means (See FIG. 1, item 28).

Regarding claim 2, Rovner discloses the magnetic detection means comprises the magnetic detection devices disposed at equal intervals on a circumference of a circle or a polygon (See FIG. 1).

Regarding claim 3, Rovner discloses the magnetic azimuth device of the magnetic detection means comprising a magnetic core made of a soft magnetic material, an excitation coil for exciting thereof, and a detection coil for detecting an external magnetic field (See FIG. 1, items 11, 15 and 21-26).

Regarding claim 4, Rovner discloses a one loop-shape magnetic core is shared by all of the magnetic detection devices (See FIG. 1, item 11).

Regarding claim 5, Rovner discloses one excitation coil is shared by all of the magnetic detection devices (See FIG. 1, item 15).

Regarding claim 6, Rovner discloses the magnetic detection coils have the same one end (See FIG. 1, note that all coils are connected to the common ground).

Regarding claim 9, Rovner discloses the magnetic core comprising a material that enable provision and elimination of inductive magnetic anisotropy to be carried out with heat treatment in a magnetic field (See Rovner FIG. 1, item 11 and col. 8, lines 47-51, note also that permalloy is a well known soft magnetic material that increases magnetic permeability upon heat treatment-see Non-patent literature internet reference explaining the known heat treatment of permalloy well known since 1923 and Ihara et al., US5,028,280).

Regarding claim 10, Rovner discloses the sampling means switches electromagnetic conversion outputs of the magnetic detection devices, and performs synchronous detection of a switched signal with a predetermined frequency, thereby sampling a voltage change corresponding to an external magnetic strength (See FIG. 1, item 12 and col. 4, lines 18-56).

Regarding claim 11, Rovner discloses the sampling means sequentially operating switches in response to a signal from a binary counter if the number of detection coils of the magnetic detection devices is set to be 2^n, the number of the switches being the same as that of the detection coils (See FIG. 1, item

12 and col. 4, lines 7-56, note that any number of sensing means can be used in the device of Rovner, encompassing 2^n. Further note the clock means 29 provides a pulse signal for the switches).

Regarding claim 12, Rovner discloses the condition determining means supplies a trigger signal to the azimuth information output means as a result of determination if the electromagnetic output being sequentially sampled by the sampling means is a maximum, a minimum, or zero crossing (See FIG. 1, items 17, 51 and 52 and col. 4, line 57 to col. 6, line 46).

Regarding claim 13, Rovner discloses the azimuth information output means outputs a signal for switching, which is sampled by the sampling means if the trigger signal is received from the condition determining means, as information indicating an azimuth of the external magnetic field (See FIG. 1, items 17, 51 and 52 and col. 4, line 57 to col. 6, line 46).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rovner in view of Yamada et al. (US 6,407,547). Regarding these claims, Rovner does not teach forming the core and coils using a thin film processing using two layer structure. Yamada et al. teaches a process for manufacturing a fluxgate having a core and coils on a substrate using a thin film processing and creating the coils using a two layer structure connected together via blinds (See Yamada et al. FIGS. 2A, 2B, 3A, 3B and 4A-4E and col. 3, line 29 to col. 4, line 35). It would have been obvious at the time the invention was made to incorporate the manufacturing method as taught by

Yamada et al. in the apparatus of Rovner. One having ordinary skill in the art would have been motivated to do so to accurately develop and align the respective exciting coil and detecting coils for improved magnetic field detection and provide a fluxgate requiring only a small space (See Yamada et al. col. 1, line 66 to col. 2, line 5 and col. 4, lines 36-46).

Cited Prior Art

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The cited references teach varying designs for fluxgates and methods of making thereof.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kenneth J. Whittington whose telephone number is (571) 272-2264. The examiner can normally be reached on Monday-Friday, 7:30am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (571) 272-2180. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kenneth J Whittington
Examiner
Art Unit 2862

kjw